

NEBC MEETING NEWS

September 1999. Dr. Les Mehrhoff, curator of the G. Safford Torrey Herbarium at the University of Connecticut, addressed the topic, “The Non-native Invasive and Potentially Invasive Flora of New England: A Regional Perspective.” He explained first that his concern was primarily about non-native species that are out-competing native flora in portions of the “minimally managed” landscape. Where once we had old fields succeeding to *Rubus*, now we are likely to see the ubiquitous *Rosa multiflora* conquering the abandoned opening. Although early American botanist John Bartram complained in print about the proliferation of *Narcissus* cultivars into the natural environment around Philadelphia, there was little mention in the scientific literature of problematic plant introductions until a pair of papers authored by M. L. Fernald in 1905 and 1939 described certain “fugitives that had escaped.” Reflective of the change in sentiment toward certain species, Fernald commented that the common name for *Hieraceum aurantiacum* in his native Maine changed from Venus’ paintbrush to Devil’s paintbrush. In the later paper, he noted a number of Asian taxa, such as *Lonicera japonica*, that were “crossing the landscape like a horde of huns.” Mehrhoff pointed out that the term “invasive” should apply only to non-indigenous species, because technically a species cannot invade its own territory. When natives behave aggressively, he recommends we use the word “explosive.” So as not to malign any species as inherently “bad,” Les cited a line from an Aldo Leopold paper in the 1940s that says that “the invasive species problem is an attribute of numbers, not species.” If not for herbarium records, Mehrhoff pointed out, it would be hard to know whether certain taxa were native or weedy introductions. An example given was the widespread Dusty Miller, *Artemisia stelleriana*, a species for which Fernald found the first American collection to be from 1879—a specimen collected by William Farlow in Nahant, Massachusetts.

Mehrhoff then discussed current efforts by himself and others in New England to develop definitions and criteria to be used for determining which species are invasive or potentially invasive in the New England region. He listed the following as characteristics of invasive species: 1) being non-native, 2) having high seed production, 3) being capable of rapid dispersal, 4) having the ability to establish easily, 5) having a competitive advantage over

associated plants, and 6) being persistent on the landscape. He then recognized two categories of non-native invasive species: "Widespread and Invasive," and "Restricted and Invasive." He and New England colleagues are calling a third "watch-list" group "Potentially Invasive Species." To determine to which of these three groups a species might belong, Mehrhoff, being a good taxonomist, has developed a work sheet that progresses through a set of criteria like a dichotomous key. The four primary questions are: (1) Is it naturalized? (2) Is it capable of rapid and widespread dispersion and establishment? (3) Is it capable of dispersing over spatial gaps? (4) Is it capable of existing in high numbers away from artificial habitats? Four additional basic criteria are: (5) Is it currently widespread or at least common in the region or in one or more habitat types? (6) Is it known to have numerous individuals in many populations in the region? (7) Does it out-compete other species in the same natural plant community? (8) Does it have the potential for rapid growth, high seed or propagule production, dissemination, and establishment in natural areas? To be considered truly invasive the answer must be "yes" to the eight questions or criteria. To distinguish between Widespread and Restricted Invasives, one must determine whether the species is widespread with many occurrences in minimally managed natural areas or simply common in part of the region or in one or more habitat types in the region. The species qualifies as Potentially Invasive if the answer is "yes" to the first four questions, but "no" to one or more of the remaining four questions. Over 50 slide images were used to illustrate taxa being considered for status as Invasive or Potentially Invasive. A draft list for New England was also distributed along with a request for feedback on it.

What else is needed to deal with the problem of invasive species? Among Mehrhoff's answers to this question was to do further inventory and research, including that aimed at getting a better understanding of species biology for many of the purported invaders. Early detection and removal of new invaders would be another important action, he said. Another avenue he encouraged was working with the nursery and landscaping industries to find native alternatives, to test and monitor new exotic introductions, and to educate their customers. A final item fitting into Mehrhoff's solutions would be a computerized "Atlas of Non-native Invasive Species in New England" that would serve as a database of current

and historical records. This, along with other information about invasive plants, he envisioned being available at a web site. Currently, the web site for the herbarium at the University of Connecticut (www.eeb.uconn.edu/collections/herbarium/herbarium.html) has a draft of Mehrhoff's list for the state.

October 1999. Rick Enser, State Botanist with the Rhode Island Natural Heritage Program, presented a slide lecture entitled "The Flora of Block Island, Rhode Island." Introducing his talk, Enser explained that in his overview of Block Island's flora, he would attempt to answer three questions about the island: how it came to be, what habitat types are present, and what factors are influencing the current vegetation and flora? Addressing the first question, he stated that Block Island's flora and fauna relate to the island's glacial history. The island is a product of glaciation, resulting from an ice sheet pushing up ocean sediments consisting primarily of clay to form much of the island's mass and characteristic bluffs. Glacial till and debris cap the sediments in places and bedrock is absent. The island is about 4.5 miles wide at its widest point and possesses 6030 acres. Using maps of the coastal islands and the continental shelf as they appeared following the retreat of the glaciers, he suggested that the flora and fauna of Block Island became isolated from the mainland about 8–9000 YBP, much earlier than occurred on Martha's Vineyard and Nantucket, which he dated at about 4000 YBP. This long isolation, he feels, is a primary reason for the depauperate flora and fauna on the island relative to some other islands of its size in the region. The indigenous fauna of the island, he pointed out, includes only two mammals, four amphibians, and six reptiles. Another reason suggested for the depauperate biota is the island's lack of a glacial outwash-plain.

Documentation of the early flora and vegetation of the island is limited. Livermore, in 1875, cited historic records from the 1600s about certain trees being used as boundary markers and surmised from this that forest must have been present on the island previously, even though it and the boundary trees were absent by this time. Pollen and wood fragment data suggest that a deciduous forest was once present on the island, too. From the time of the Revolutionary War to the present, the island has been largely an open, agricultural landscape grazed by livestock such as horses, cows, and sheep. Early botanical exploration by Rob-

bins in 1829 documented two Rhode Island records, *Arenaria caroliniana* and *Hydrocotyle verticillata*, not seen since on the island. Other botanical explorers of the island to follow were Henri Young, Stephen T. Olney, and William W. Bailey. In an 1893 article in the *Bulletin of the Torrey Botanical Club*, Bailey reported an island flora of 294 species. An interesting record by Bailey was *Ranunculus cymbalaria*, which he described as abundant around the perimeter of Great Salt Pond. This once-brackish pond has since been permanently breached and the buttercup can no longer be found there, Enser said. Botanists following on Bailey's heels included Arthur Hollick, James F. Collins, and M. L. Fernald. Interestingly, in 1913 Fernald was the first to collect *Liatris scariosa* var. *novae-angliae* on Block Island. "Could this conspicuous species have been overlooked by the earlier botanists?" Enser asked. Grazing by livestock and deer, he added, is now widespread on the island and threatens this species and others. Fenced exclosures are being used by conservationists to protect selected sites for the species. Some species such as *Platanthera lacera*, he suspects, are gone due to the heavy deer browsing activity. Despite some losses, the number of species documented for the island has increased to around 760, Enser said, but primarily due to intensive exploration and the increase in the number of nonindigenous species present. Block Island's flora includes most of the region's most invasive taxa, and Enser estimated that about 30% of its current flora is introduced. *Populus alba*, for instance, was introduced about 1850 and now has dense colonies established about the island.

Habitats on the island include extensive dunes; salt flats and marshes; freshwater ponds; sedge meadows; shrub thickets; inland shrub communities dominated by *Viburnum dentatum*, *Myrica pensylvanica*, and *Amelanchier* spp.; managed open grasslands used for grazing and hay fields; and a depression area with a pocket of forest possessing *Nyssa sylvatica* and *Fagus grandifolia*. Also in this depression are the island's only woodland wildflowers such as *Maianthemum canadense*, first found by Fernald, and *Anemone quinquefolia*, discovered for the first time on the island only a couple of years ago. Perhaps the most important plant community on the island in Enser's eyes are small areas of open moraine with maritime grasses and herbs, located on slopes and tops of knolls. Here, indigenous species prevail and rare plant taxa for the island and state persist. In these areas one can find

Liatris, *Helianthemum dumosum*, *Aristida purpurascens*, and *Chrysopsis mariana*.

In closing remarks, Enser said that the future for natural vegetation on the island appears dim despite 25% of the land base being in conservation management. Nonindigenous species, including many invasive species, comprise more than 50% of the island's vegetative cover, and development pressures for additional housing and recreation are on the rise.

October 1999 Field Trips. On Friday afternoon, preceding the Club's evening meeting, about 15–16 enthusiastic Club members and friends explored the south shoreline of Worden Pond in South Kingstown, Rhode Island. Rick Enser led the outing. The water level was relatively low, so walking was mainly on mudflats among beds of exposed wetland plants that are typically emergent from standing water. The area was scoured for plants, both familiar and new. Dominant species included *Juncus militaris*, *Euthamia tenuifolia*, and *Gratiola aurea*. Locally dense patches of basal rosettes belonging to *Sabatia kennedyana* could be found below the taller vegetation, but not a single flowering stem was seen; it was suspected that this was due, in part, to two successive high water years. Some of the more uncommon finds of the day were occasional fruiting stems of *Ludwigia sphaerocarpa*, a plant or two of *Glyceria obtusa* bearing dense panicles of long spikelets, and a few clumps of *Rhynchospora macrostachya*. Aquatic finds included *Elatine minima* and *Vallisneria americana*, the latter possessing mature fruits attached to elongated scapes, coiled as they do following anthesis.

On Saturday a small group of 8–10 Club members, led by Dr. Keith Killingbeck of the University of Rhode Island and by Rick Enser, toured Ell Pond in Hopkinton, Rhode Island. The site is owned by The Nature Conservancy and is the only designated National Natural Landmark in Rhode Island. The vertical relief of the site surprised many as we scrambled upward along a trail of granitic bedrock and boulders. Alongside the trail we examined a mature, mixed hardwood/conifer forest where we found *Chamaecyparis thyoides*, *Pinus strobus*, *Tsuga canadensis* (some infested with hemlock adelgid), *Nyssa sylvatica*, *Pinus rigida*, *Quercus coccinea*, and *Q. prinus*: an uncommon mixture of species characteristic of either wet, mesic, or dry, well-drained sites. Another special feature of the site was the abundance of *Rho-*

dodendron maximum in the understory, giving one the feeling of being in the Southern Appalachians. The group could not resist a quick foray to the edge of Ell Pond where some typical bog species such as *Rhynchospora alba*, *Vaccinium macrocarpon*, *V. oxycoccos*, and *Sarracenia purpurea* were seen on a narrow *Sphagnum* mat that edged the pond.

—PAUL SOMERS, Recording Secretary.